

WHAT IS CLAIMED IS:

1. A heating element CVD system comprising:

a processing container in which a predetermined processing is performed to a substrate held by a substrate holder disposed therein;

an evacuation system which is connected to the processing container and evacuates the processing container to a vacuum;

a raw material gas supply system for supplying a predetermined raw material gas into the processing container; and

a heating element which is disposed in the processing container and is supplied with electric power from an electric power supply mechanism, thereby being heated to high temperatures;

wherein the raw material gas introduced into the processing container from the raw material gas supply system is decomposed and/or activated by the heating element kept at high temperatures to form a thin film on the substrate held by the substrate holder;

wherein one or a plurality of connection terminal holders is placed in the processing container, each of the connection terminal holders holds a plurality of connection terminals at a predetermined position with electrical insulation therebetween; each of the connection terminals connects the heating element to the electric power supply mechanism electrically; the heating element connected to the connection terminals is supported facing the substrate holder; and a connection region of the heating element connected to the connection terminal is not exposed to a space in the processing container, and

further comprising a shield plate having a heating element passing hole through which the heating element passes in a noncontact manner and a plurality of through holes for passing gas is arranged between a part of the heating element extending into the processing container through the heating element passing hole and a surface of the connection terminal holder facing the inside of processing container.

2. A connection structure between a heating element and an electric power supply mechanism in a heating element CVD system which comprises a processing container in which a predetermined processing is performed to a substrate held by a substrate holder disposed therein; an evacuation system which is connected to the processing container and evacuates the processing container to a vacuum; a raw material gas supply system for supplying a predetermined raw material gas into the processing container; and a heating element which is disposed in the processing container and is supplied with electric power from the electric power supply mechanism, such that the heating element is heated to high temperatures; and wherein the raw material gas introduced into the processing container from the raw material gas supply system is decomposed and/or activated by the heating element kept at the high temperatures to form a thin film on the substrate held by the substrate holder; the connection structure comprising:

- a connection terminal for connecting the heating element to the electric power supply mechanism such that a connection region of the heating element connected to the connection terminal is not exposed to a space in the processing container;
- a connection pin provided at an end portion of the heating element;
- and
- the connection terminal is provided with a pin receiver having a small hole, through which the connection pin provided at the end portion of the heating element is inserted or removed and the inside diameter of which is smaller than a diameter of the connection pin, and a slit laterally to a direction in which the connection pin is inserted or removed is provided on the peripheral wall of the said small hole forming the said small hole.

3. The connection structure between the heating element and the electric power supply mechanism in the heating element CVD system as claimed in claim 2, wherein the connection terminal has a connection terminal inside hollow portion provided on a side facing the inside of the processing container and communicating with the pin receiver through a heating element passing hole and a gas passing hole for making the connection terminal inside hollow portion communicate with the space in the processing container at a part facing the inside of processing container and in which the heating element connected to the connection terminal is passed through the gas passing hole in a noncontact manner, thereby the connection region of the heating element connected to the connection terminal is prevented from being exposed to the space in the processing container, and

wherein a spacer is interposed between the inside peripheral wall of the heating element passing hole and the connection pin at the end portion of the heating element, and the spacer is arranged on a side of an opening facing the connection terminal inside hollow portion of the heating element passing hole.

4. A connection structure between a heating element and an electric power supply mechanism in a heating element CVD system which comprises a processing container in which a predetermined processing is performed to a substrate held by a substrate holder disposed therein; an evacuation system which is connected to the processing container and evacuates the processing container to a vacuum; a raw material gas supply system for supplying a predetermined raw material gas into the processing container; and a heating element which is disposed in the processing container and is supplied with electric power from the electric power supply mechanism, thereby being heated to high temperatures; and wherein the raw material gas introduced into the processing container from the raw

material gas supply system is decomposed and/or activated by the heating element kept at high temperatures to form a thin film on the substrate held by the substrate holder; the connection structure comprising:

5 one or a plurality of connection terminal holders placed in the processing container, each of the connection terminal holders holds a plurality of connection terminals at a predetermined position with electrical insulation therebetween; each of the connection terminals connects the heating element to the electric power supply mechanism electrically; the heating element connected to the connection terminals is supported facing
10 the substrate holder; and a connection region of the heating element connected to the connection terminal is not exposed to a space in the processing container;

a connection pin is provided at an end portion of the heating element;
and

15 the connection terminal is provided with a pin receiver having a small hole, through which small hole the connection pin provided at the end portion of the heating element is inserted or removed and the inside diameter of the small hole is smaller than a diameter of the connection pin, and a slit extending laterally in a direction in which the connection pin is
20 inserted or removed is provided on the peripheral wall of the said small hole forming the said small hole.

5. The connection structure between the heating element and the electric power supply mechanism in a heating element CVD system as claimed in claim 4,

25 wherein the connection terminal has a connection terminal inside hollow portion provided on a side facing the inside of the processing container and communicating with the pin receiver through a heating element passing hole and a gas passing hole for making the connection terminal inside hollow portion communicate with the space in the processing

container at a part facing the inside of processing container and in which the heating element connected to the connection terminal is passed through the gas passing hole in a noncontact manner thereby the connection region of the heating element connected to the connection terminal is prevented from being exposed to the space in the processing container, and

wherein a spacer is interposed between the inside peripheral wall of the heating element passing hole and the connection pin at the end portion of the heating element, and the spacer is arranged on a side of an opening facing the connection terminal inside hollow portion of the heating element passing hole.

6. A connection structure between a heating element and an electric power supply mechanism in a heating element CVD system which comprises a processing container in which a predetermined processing is performed to a substrate held by a substrate holder disposed therein; an evacuation system which is connected to the processing container and evacuates the processing container to a vacuum; a raw material gas supply system for supplying a predetermined raw material gas into the processing container; and a heating element which is disposed in the processing container and is supplied with electric power from the electric power supply mechanism, thereby being heated to high temperatures; and wherein the raw material gas introduced into the processing container from the raw material gas supply system is decomposed and/or activated by the heating element kept at the high temperatures to form a thin film on the substrate held by the substrate holder; the connection structure comprising:

one or a plurality of connection terminal holders placed in the processing container, each of the connection terminal holders holds a plurality of connection terminals at a predetermined position with electrical insulation therebetween; each of the connection terminals connects the heating element to the electric power supply mechanism electrically; the

heating element connected to the connection terminals is supported facing the substrate holder,

wherein each of the connection terminal holders has a first inside hollow portion to which a gas introduction system for introducing gas is connected;

each of the plurality of connection terminals held at a predetermined position with electrical insulation therebetween has a connection terminal inside hollow portion provided on a side facing the inside of processing container and a gas passing hole which makes the connection terminal inside hollow portion communicate with the space in the processing container on a side facing the inside of processing container and through which the heating element connected to the connection terminal is passed in a noncontact manner thereby a connection region of the heating element connected to the connection terminal is prevented from being exposed to a space in the processing container;

wherein the connection terminal inside hollow portion is made to communicate with the first inside hollow portion of the connection terminal holder,

a connection part between the connection terminal and the electric power supply mechanism, or the connection part between the connection terminal and the electric power supply mechanism and a wiring part for electrically connecting the connection terminal and the other connection terminal is arranged in the first inside hollow portion, and

further comprising an insulator arranged so as to cover a part facing the first inside hollow portion of the connection part and the wiring part, or a surface of the connection terminal holder facing the first inside hollow portion is covered with an insulator.

7. The connection structure of claim 6, wherein the insulator is arranged so as to cover the part facing the first inside hollow portion of the connection part and the wiring part, and the surface of the connection terminal holder facing the first inside hollow portion is covered with the insulator.